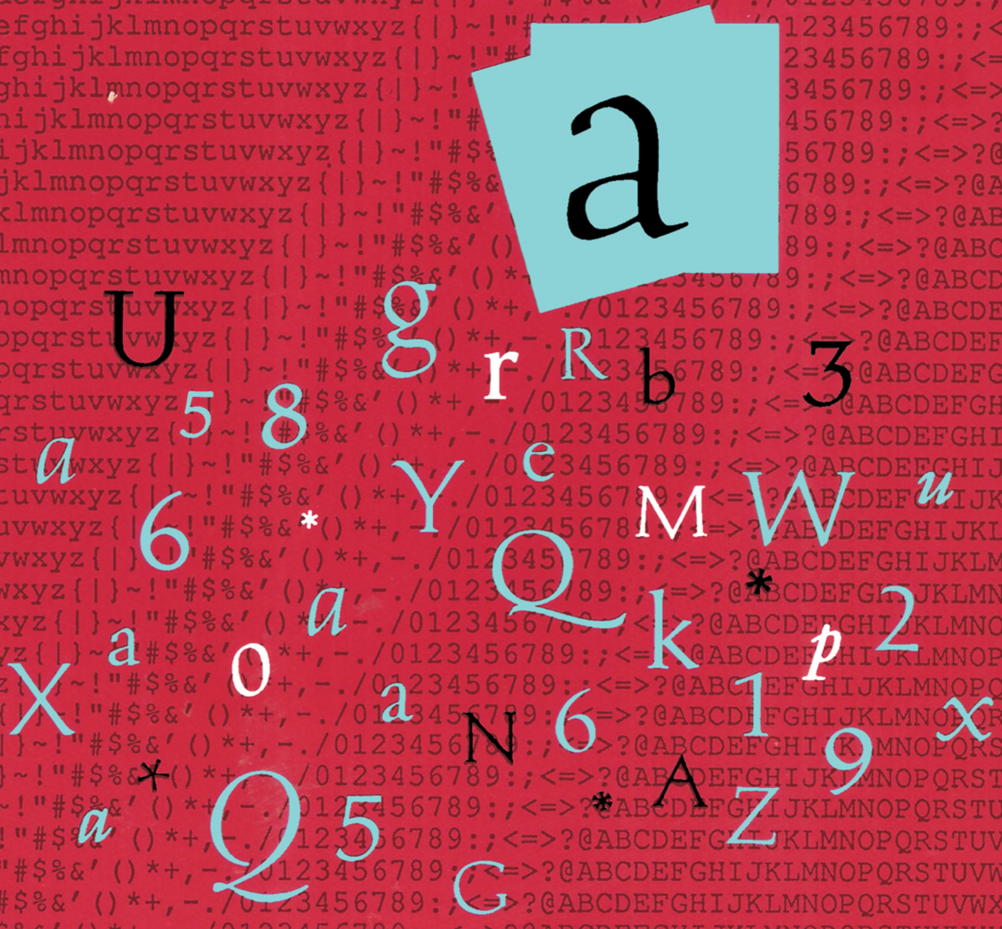
The Art of Technical Documentation

Katherine Haramundanis



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About This Book

Who Is the Audience of this Book?

If you are a novice technical writer who works in the computer industry, or are considering such a position, this book is for you. Read this book from start to finish; don't skip around. This book will help you become a better writer; and you'll find references and suggestions for further reading when you want to extend your knowledge.

To get the most from this book, you should have the following skills and experience:

- be well trained in writing English
- have had exposure to computer systems
- have taken at least one course or had experience in expository writing, such as doing investigative reporting or writing material based on fact
- have taken introductory courses in computer science and a science such as geology, biology, physics, or astronomy
- understand the logical flow of ideas

What Is the Thesis of this Book?

The thesis of this book is that the practice of technical writing is not the same as that of scientific writing, that it is closer to investigative reporting. When you create technical documentation, you need to gather information rapidly and identify audience; these are tasks the scientist need not perform. Scientists are thoroughly trained in their respective fields and know their audience well—their readership is primarily their colleagues, people trained in their field.

Further, technical documentation is as much an art as a science. Its practices can border on the intuitive, and require creative thought on your part. The work you do requires creativity and problem-solving skills, and you must use your imagination to write technical documentation, though what you write won't be fanciful—it's based on fact. You apply analytical thought to dissect and understand the information you gather, but there are few rules on how to gather information, or how to put that information together in a way that your reader will understand most readily.

When you gather information, you learn to work with your technical resources, and you learn from your reviewers. When you prepare your documents, your appreciation of your readers, what they know, and their reasons for using the documentation come into play. This is where new techniques are still being developed for the technical documentor.

Your art consists of the techniques you master to gather, understand, and distill your technical information; you show your craft in the effectiveness of your documentation and in your proficiency with your language and your tools.

The field of technical documentation is more than just its day-to-day practice. Its industrial practitioners are paralleled by a body of scholars in academia who help to explain and enhance professional practice. I cite academic references in text, at the end of each chapter, and in the Select Bibliography. You'll find short titles and (author, date) in the references in text or at the end of each chapter; the bibliography is alphabetical by author.

What Is the Structure of this Book?

This book is my view of what it takes to produce effective technical documentation. This is not a style guide that deals with all aspects of typography and copyediting, but presents for your use the distilled knowledge of my experience. After preliminaries, you'll find general precepts, then three chapters that address practice and techniques. The last major chapters summarize and compare software and hardware tools you are likely to encounter. Appendices gather reference material. In more detail:

- Chapter 1 defines technical documentation, and describes quality in technical documentation.
- Chapter 2 describes career paths and documentation management styles.
- Chapter 3 describes the precepts of technical documentation, and provides examples of applying those precepts. This chapter also provides background information on CALS, a strategy for moving from paper to electronic media.
- Chapter 4 describes the practices for gathering information, understanding what you have gathered, and methods for testing documentation.
- Chapter 5 describes the use and preparation of graphics, important components of most technical documentation.
- Chapter 6 describes considerations of information representation, to provide insights on how different representations affect reader perception of your documents.
- Chapter 7 describes some currently available tools and compares popular documentation tool methodologies. These tools exemplify current tools—new tools will evolve from them.

- Chapter 8 describes representative hardware systems used in preparing technical documentation. New hardware for documentation also evolves, and this chapter provides only a snapshot of some current systems.
- Chapter 9 presents a brief conclusion.
- Appendix A lists and briefly describes professional societies, conferences, and journals relevant to the work you do.
- Appendix B contains lists and tables of relevant standards.
- Appendix C shows a timeline of milestones in the development of writing and writing tools.
- The book ends with a glossary of terms, an annotated bibliography of books and papers, and an index.

A Word about Style and Conventions

The writing style of this book is deliberately gender-neutral. The style favors non-gender-specific words such as author, writer, engineer, programmer, or developer, and avoids words like he or she.

You will also find a few professional tips, indicated by the word "TIP" and an arrow offset at the side of the page.

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The opinions expressed in this book are mine, and do not necessarily reflect the views of Digital Equipment Corporation. I have benefited from the advice and comments of my technical resources, but any errors remaining in this book are of course mine.

The Art of Technical Documentation

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Technical Documentation Defined

1

Things are always at their best in their beginning.

Blaise Pascal, *Pascal: The Provincial Letters*, No. 4, 1656/7

When you write technical documentation, you follow a discipline and create specialized types of material. The techniques you learn to use are generic; you will find that you can use these techniques whether you are developing documentation for computer hardware or computer software. You can also use these same techniques when you create technical documentation in other industries and for other business environments.

This chapter describes what technical documentation is and what constitutes technical documentation. Technical documentation is both the work you do when you prepare technical documents and the result of your work. This double meaning for the phrase is like the double meaning of the word "painting": both the work the artist performs, painting, and the result of the artist's work, the painting.

In the context of this book, *technical documentation* is any written material about computers that is based on fact, organized on scientific and logical principles, and written for a specific purpose. When you write technical documents about computers, the subject you write about has a technical nature and you write with a specific purpose. The scientific and logical principles you follow are:

- To substantiate, or be able to substantiate, the statements you write
- To develop your ideas logically

This is a narrower definition than that of technical writing, whose definition is still developing. Some suggest, for example, that technical writing is writing for a purpose, while others suggest that it is a language a social group has agreed is useful.

All technical documentation is nonfiction (though sometimes you may feel you are writing fiction!), and all technical documentation has technical content—whether the purpose of the piece is reportage, instruction, or persuasion.

According to *Webster's Ninth New Collegiate Dictionary*, the term nonfiction appeared only in 1909. Technical documentation is even newer. Newspaper articles, magazine articles, and biographies, for example, being based on fact, are all nonfiction, but such literature is not technical documentation. However, a newspaper article can be technical documentation if the article describes a technical subject related to computers, and if the writer handles the subject without exaggeration or gross inaccuracy.

In some engineering organizations, "documentation" includes the parts lists for a product or the engineering drawings or specifications prepared by engineers, but you won't usually work on this type of document, except perhaps as a technical editor. This book primarily addresses the writer creating original technical documents rather than the editor of documents written by someone else.

Types of Technical Documents

There are three types of technical documentation: marketing materials, materials that report, and instructional materials.

Marketing or sales pieces are intended to convince or persuade; pieces that report state the facts without a persuasive or instructional slant; and instructional pieces can both instruct and train. Pieces that instruct include traditional documents that describe a product for the user. Sometimes you may have opportunities to provide materials for use in presentations.

Table 1.1 shows the documents you may write in these three categories. This book primarily addresses writing instructional materials in the computer industry.

Now that you have a view of what technical documentation is, you need a perspective of what makes high quality in technical documentation. This is the subject of the next section.

Quality in Technical Documentation

High-quality technical documentation is:

- Accurate
- Complete
- Usable
- Clearly written
- Readable
- Logically presented

Table 1.1
Technical Documentation Types

Marketing	**Reporting**	**Instructing**
brochure	magazine article	customer manual
case study	newspaper article	user manual
sales pamphlet	journal article	instruction manual
press release	internal publication	site preparation manual
product handbook	technical paper	installation manual
product catalog	progress report	owner's manual
marketing script	internal report	reference manual
marketing talk	annual report	maintenance manual
sales presentation	blueprint	system manager's manual
technical summary		operator's manual
advertising copy		technical description
white paper		functional specification
"mock" paper		user interface specification
testimonial		glossary
data sheet		training manual
product brief		quick-start guide
application guide		presentations
		course materials

- Concise
- Written with appropriate language
- Grammatical
- Appropriate in content and scope
- Presented in an appealing package

Accuracy

An accurate document contains neither errors of fact nor misstatements that will confuse the reader. For example, when you write that to perform a task the user should press the E key, and the user really needs to press the CONTROL and E keys simultaneously, you make an error. Or you might omit a step in a procedure or add an extra space in a command line. You can commit these errors if you write your document hurriedly or don't become familiar with your product. You should also verify, or have someone else verify, any procedures you write.

TIP ➧ ***Take the time to verify your facts.***

A good way to verify a procedure is to draw a flowchart or a Nassi-Shneiderman diagram (see Chapter 4) of the procedure. This can often show missing steps or steps that lead nowhere. Another effective way to verify a procedure is to have someone who does not know the procedure follow your written text and perform the procedure. The tester can mark up your written text, or you can watch the tester follow the procedure and note any difficulties the tester has. (For more on these techniques, see Chapter 4.)

Completeness

A complete document does not leave out something that is important to the reader. For example, if you write a reference manual, be sure that it contains all the commands or statements of the product.

If you write a procedure, be sure there are no missing steps. Or if you write a manual to describe the error messages the user can see on a system, make sure it contains all the error messages. If you leave even one out, and the user sees that one on the system, confidence in the completeness and accuracy of your documentation will be eroded. So check your document carefully to be sure you have found and included all possible error messages. Your technical resources must help with this task by providing you with a complete list of error messages, but you are the one who must verify the completeness of your document.

Usability

A usable document is one your reader can use easily—it is not too bulky or designed in such a way that your reader must work extra hard to find the information. Usability applies both to printed books and online texts. The organization of your information is important too. If you don't organize your information so that your reader can grasp the information quickly, you will only frustrate your reader. Your reviewers can help you find out if your document is usable (more on these topics in Chapter 4).

Usability tests help you determine if you have created a usable document and show you how to correct faults in documents that are less than usable. Usability tests also help you analyze the effectiveness of the information you provide.

When people began to write technical documentation, they practiced their art intuitively—the work was essentially a craft. As we have gained more experience, we have learned more about the effectiveness of technical communication and have developed analytical methods to examine and test documents.

Usability tests, properly applied, can be extremely effective. If you conduct such tests and modify your information accordingly, you will find that your documents and information packages become more effective.

You can conduct your own usability tests—you don't need an elaborate laboratory setup to do this testing (more on this in Chapter 4).

Clarity

Write the text in your document clearly. Follow the rules of good writing, and trust your reviewers to help you find those muddy passages or that flawed logic. Even a reviewer who just puts a question mark in the margin of your draft helps you improve the clarity of your document. If that reviewer doesn't understand what you wrote, others won't either. Take the opportunity to discuss the information in the confusing paragraph or sentence with your reviewer. You will very likely find there is another way to present the information that is more clear.

The prize for ambiguity in writing belongs to the order issued by British headquarters at the battle of Balaclava (1854): "to advance rapidly to the front and try to prevent the enemy carrying away the guns." The intent of the order was for the Light Brigade cavalry unit to retake guns that had just been captured by the enemy; the result was that the Light Brigade charged an entrenched enemy position in the opposite direction and was slaughtered.

Most of what you write won't have such dire consequences, but if, for example, you are describing a software application that controls a nuclear power station, you might find that what you write is a critical piece of documentation.

So when you are writing technical documentation, be aware of the ambiguity of what you write, and examine your work to eliminate ambiguity wherever possible.

Readability

Your text and document must be readable. What does this mean? If your document is readable, your reader will understand it. For example, if you are writing for experienced programmers, you can expect they will be familiar with the technical terms of the trade. But if you are writing for novices, you need to explain all your terms and be particularly careful in consistent use of those terms. Otherwise you will confuse your readers. Readers don't expect synonyms in technical documentation; in fact, they will be confused by an alternative word and may wonder if you are introducing a new concept.

If you like, you can use a readability test software program to help you determine if your prose is written at the level of education expected of your reader. You'll find more about readability in Chapters 6 and 7.

Logical Progression

Your text must flow in a logical progression, from simple to more complex or from start to finish of a procedure. To some extent, writing logically is part of writing clearly, but logical progression should be evident in your organization of information and in how you approach your subject.

Conciseness

Avoid verbiage and keep your sentences and words as short as possible. Learn to discard ruthlessly words that add no information to your text. For example, avoid phrases such as "in order to" ("to" does the job). You can find these extraneous words by actively reading what you have written. Also read what you have written after an interval—some read their words aloud. Always use a short word rather than a long one if the two words have the same meaning. For example, don't use "utilize" when "use" will do. Many style books contain lists of such short substitutes for long and pompous words and phrases.

When you must get information across instantly, use the *one-page display*: distill critical information to a single page. You will need to put a lot of thought into a one-page summary of anything complex, but such a piece can be extremely effective. You will often need to use a diagram or a table to compress information onto a single page. Command lists, balance sheets, and reading paths are examples of one-page representations of critical information. For an example of a one-page8 display, see Figure 4.5.

Appropriateness of Language

Establish the language that is appropriate for your intended reader. When you write a sales brochure, for example, you have perhaps twenty seconds to catch the reader's interest: your text must be brief. So using the right words and the ideal turn of phrase is critical. The shorter your piece, the more important each word it contains. A sales piece will use at least one of the Great Attractors of technical documentation (for more on the Great Attractors, see Chapter 6).

Most technical documentation is written in a rather formal style. For example, when you write a computer manual, you will avoid slang and contractions. This book, although about technical documentation, is less formal than much technical documentation—it is not a computer manual, so I take some liberties with my writing style.

A good way to find out what language style is best for a specific piece is to read other pieces written for the same reader. That helps make you familiar with the terminology and phraseology of the subject about which you will write. Of course, if you are developing a piece for a wholly new readership, you have to rely on yourself and your reviewers to ensure that you use the right mix of words, tone, and phrases. You may be able to examine competitive literature for ideas about appropriate writing style.

You will find examples of several writing styles in this book.

Grammaticality

Be sure all your sentences and phrases are grammatical. Readers will give up if you make too many grammatical errors. These errors include errors in spelling and punctuation as well as errors in grammatical form.

For example, the sentence "The motor shut down when you press the disable key" is ungrammatical because the subject ("motor") and the verb ("shut") are not in agreement. (The verb should be "shuts.") Ask a copy editor or literary editor, or perhaps a writing peer, to review your work. Their constructive criticism can be invaluable in helping you find and correct such errors. Spell-checking software can find some spelling errors, but it won't warn you about grammatical errors. If you are not sure about your grammar, enlist the aid of another writer or an editor, or consult a grammar book. (You will find the names of some good grammar books at the end of Chapter 3.)

Appropriateness of Content and Scope

Your piece must have appropriate content and scope. For example, there is no point writing a piece for the novice that contains all the details only an expert could want to know, and there is no point writing a step-by-step user manual for an expert who will find the progression of thought and exposition much too slow.

You can verify your content and scope by checking your table of contents against the norms for your readers, by contact with your readers or potential readers, and from your technical resources.

Appeal of Package

The excellent book you have written won't be read if the packaging that presents it to the reader is awkward, messy, or hard to use. If possible, work with those who guide the printing process to ensure that your document resides in an attractive package when it reaches your customer.

Part of packaging is binding, which is discussed in Chapter 6. Consider the convenience of your reader, the lifetime of your book, and how frequently you will need to update your book when you think about packaging.

Further Reading

You can explore the quality elements of technical documentation by reading *The Elements of Style*, third edition (Strunk and White, 1979) and a good style guide (you will find several listed at the end of Chapter 3). You can also gain an appreciation for a variety of styles in English prose by reading *The Reader over Your Shoulder* (Graves and Hodge, 1964) or *Language in Action* or *Language in Thought and Action* (Hayakawa, 1941, 1978).

For More Ideas

Some popular books and articles on scientific or technical subjects can also help you understand the subtle elements of high-quality writing you can use in your work. Examples include *The New Physics* (Taylor, 1972), articles in *Science News* and *Scientific American*, and the works of Martin Gardner. *Popular Mechanics* is another good source for clearly written technical articles.

A Career in Technical Documentation

2

A scribe whose hand moves as fast as the mouth, that's a scribe for you!

Sumerian proverb, c. 2400 B.C., translated by Edmund Gordon,
cited by S. N. Kramer in *The Sumerians*.

To give you an idea of what technical writers do, these next paragraphs provide scenes of the kind of day many writers have. The names and projects are purely fictitious.

Larry, the Documentation Project Leader

Larry Leader has been a writer at X Corporation for eight years. In that time, he has worked on four different software products and is now documentation project leader for the Xproduct, a software system that runs with the ABC operating system. Larry's job as project leader is to coordinate the work of the other writers, ensure that they keep up with software changes, and be a resource to them.

Larry starts his day at 8:05 A.M. when he drives into the large X facility along Route 495 in Marlboro, Massachusetts. His well-lit office on the third floor contains color-coordinated office furniture, a terminal, and a work station system. His neighbors include developers working on the Xproduct software as well as other writers working on the project.

Larry sits down and taps the Return key on his work station; the screen comes to life, displaying a password window. After entering his password, he opens a window to read his mail and then opens another to make changes (edits) to a document he needs for the writing team meeting he will run, scheduled for ten o'clock.

By 9:55 Larry has completed his strategy document and run off ten copies for his meeting. He picks up his project notebook and walks down the aisle to the conference room he has reserved. A writer is there already, and they chat amiably as the other writers enter the room in twos and threes.

TIP ➧ ***Write out your agenda for all to see.***

Larry writes his agenda for the meeting on the whiteboard: current status of Version 1.0, plans for Version 1.1, documentation strategy for Version 1.1, and assignments. He ends his list with "other" to encourage discussion of topics not covered previously. By 10:05 he starts his meeting.

Jamie Junior, a novice writer who has been on the project for about eight months and who is new to X, asks when she needs to give her last book, the installer's guide, to production, the group that will prepare camera-ready copy. Because the software was not done when expected, the final software date has been delayed by two weeks. Jamie asks if she should keep her book open for the two-week period. After some discussion, and after hearing from several other writers on the project, Larry advises her to complete her document as planned but to check with him when she plans to hand her files to production.

Annie Able, writer of the programmer's reference manual, also asks about the changed date. Will it affect her book? After more discussion, Annie agrees to complete her book on the date planned.

Larry passes out the new version of the documentation strategy, points out the changes he has made, and suggests tentative writing assignments. Jamie will update three small documents for the next version and agrees to write the Release Notes. This is a specially challenging assignment because she must work very closely with development during the last few weeks of the project and keep up with a steady stream of changes during field test.

Annie agrees to maintain the programmer's manual and to create a new reference card. The other writers agree to their assignments of administrator's manual, user's manual, help text, and troubleshooting manual. Larry assigns the installation guide to himself, in addition to a second book, the error message manual.

Larry concludes his meeting and returns to his office, where he makes his final edits to the documentation strategy and copies the completed file to the public area on the large computer system. (The public area contains files that others in the company can copy and print at their local sites by accessing the files over a network.)

TIP ➧ ***Use common directories and electronic mail.***

He then sends electronic mail to the writers, the development team, the product manager, the customer services people, and those who have expressed an interest in seeing the documentation strategy, informing them that the strategy is available; he asks them to return comments within two weeks.

After lunch, Larry attends a development meeting. The room is already nearly full with developers, qualification engineers, testing people, and writers. Desultory discussions about equipment issues cease when the development project leader arrives, carrying two small computer tapes. He holds one of them up and asks: "I have this morning's software version here on this tape; is there any reason I should not send it to our field test sites?"

This question prompts a lively discussion, with comments, questions, and